



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/070,173	03/04/2002	Dominique Morin	0502-1002	2959

466 7590 09/03/2004
YOUNG & THOMPSON
745 SOUTH 23RD STREET 2ND FLOOR
ARLINGTON, VA 22202

EXAMINER

ANDREWS, MELVYN J

ART UNIT	PAPER NUMBER
----------	--------------

1742

DATE MAILED: 09/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/070,173

Applicant(s)

MORIN ET AL.

Examiner

Melvyn J. Andrews

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 11, 12 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

This application contains claims 11,12 and 14 are drawn to an invention nonelected with traverse in Paper filed October 28, 2003. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

Claims 1 to 10 and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification discloses that the **bacterial culture is novel** but there is no indication that a **deposit** of the **novel bacterial culture** has been made (MPEP 2404) but this bacterial culture is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Response to Arguments

Applicant's arguments filed June 14, 2004 have been fully considered but they are not persuasive. The bacteria used by applicants isn't just the normal *Sulfolobus* bacterium disclosed in the prior art. Instead it is a **MUTATED** form of the bacterium which was produced by culturing the bacteria successively in culture medium with

successively higher concentrations of copper in solution, so that the bacteria "adapted" to become more copper tolerant (see specification page 3, top paragraph). Such "adaptation" occurs by spontaneous mutation of the genes of the bacterium, and by the enhanced survival of the mutants which can survive in the higher copper concentrations. This mutant *Sulfolobus* strain is not taught by the prior art, and appears to be essential for the claimed invention. Thus to be enabling the specification must either disclose a repeatable method for obtaining the mutants, or applicants must deposit the mutant strain so that other workers can obtain it for use in their process.

Since mutation is a spontaneous and uncontrolled event, it is fair to assume that it is not repeatable. Applicants may rebut the presumption of non-repeatability by submitting a Rule 132 declaration, demonstrating that they obtained copper-tolerant mutants from several *Sulfolobus* bacterial cultures (genetically different strains) at several different times (during several different repetitions of the experiment). This would support the position that the mutation occurs readily enough that one skilled in the art could take any *Sulfolobus* culture and obtain such mutants.

But if they only got mutants from one particular culture (of a particular genetic makeup which was more susceptible to mutation, or which was the only genetic makeup that had the mutant gene to begin with), then they have not demonstrated repeatability and they need to deposit the organism in accordance with 37 CFR 1.801-1.809.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The expression "particularly of chalcopyrite" is exemplary claim language which is indefinite MPEP 2173.05(d).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2, 4-6 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tunley (US 5,919,674) in view of Hutchins et al (US 4,729,788) and further in view of Whellock et al (US 5,021,069). Tunley describes a method for treating copper sulphide concentrates comprising a bioleaching step, carried out in reactors arranged in series for dissolving the copper with a bacteria such as Sulpholobus and at an optimum temperature for the bacteria (col.2, lines 54 to 59) but does not disclose mineral sulphides supplied continuously, mechanically agitating the bacterial culture and injecting air into the medium are not explicitly disclosed but Hutchins et al (US 4,729,788) discloses the advantages of these features, such as, "continuous bioleaching" (col.3, lines 30-32 and Fig 1) and "stirred reactors" (col.3, lines 38-40); "aeration using air or oxygen" (col.4, lines 48-52) and (col. 5, line 56 to col. 6, line 25 and Fig 4), it would have been obvious to one of ordinary skill in the art at the time the

Art Unit: 1742

invention was made to modify the Tunley method as taught by Hutchins et al, the motivation being to enhance the recovery from ores following pretreatment or ores as taught by Hutchins et al . Whellock et al a method of effecting a bioreaction comprising introducing a gas into a mixture comprising a liquid phase material and a solid biomass which gas is "substantially pure oxygen or oxygen-enriched air" (col.14, lines 14-17) the mixture comprising a sulfide containing ore which includes Cu (col.13, lines 16-20) and wherein the mixture contains a micro-organism *Sulfolobus acidocaldarius* (col.14 , lines 30- 34) which is further evidence that it is conventional to promote oxygenation by an injection into a medium, air enriched with pure oxygen as claimed.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over over Tunley (US 5,919,674) in view of Hutchins et al (US 4,729,788) and further in view of Whellock et al (US 5,021,069) as applied to claim 1 above, and further in view of Heinen et al (US 3,890,007). Heinen et al discloses the advantages of precipitating the iron from the copper solutions to be extracted using solvent (col.2, line 11 to col.3, line 31).

Claims 1, 2, 4-6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over International Application Publication WO 98/39491 in view of Hutchins et al (US 4,729,788) and further in view of Wheellock et al (US 5,021,069) . The '491 publication discloses a process for leaching of copper from chalcopyrite comprising a bacterial oxidation process using bacterial oxidation controlled by controlling the oxygen supply (page 2, lines 10 to 16) which is applicable to stirred tank leaching methods (page 4, lines 3 to 6) but does not disclose a cascade of tanks but

this feature is disclosed by Hutchins et al (see col.5, line 56 to col.6, line 25 and Fig. 4)it would have been obvious carry out the '491 publication process using a plurality of tanks to enhance the recovery from ores following pretreatment of ores as taught by Hutchins et al. . Whellock et al a method of effecting a bioreaction comprising introducing a gas into a mixture comprising a liquid phase material and a solid biomass which gas is "substantially pure oxygen or oxygen-enriched air" (col.14, lines 14-17) the mixture comprising a sulfide containing ore which includes Cu (col.13, lines 16-20) and wherein the mixture contains a micro-organism *Sulfolobus acidocaldarius* (col.14 , lines 30- 34) which is further evidence that it is conventional to promote oxygenation by an injection into a medium, air enriched with pure oxygen as claimed.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over International Application Publication WO 98/39491 in view of Hutchins et al (US 4,729,788) and further in view of Wheellock et al (US 5,021,069) as applied to claim 1 above, and further in view of Heinen et al (US 3,890,007). Heinen et al discloses the advantages of precipitating the iron from the copper solutions to be extracted using solvent (col.2, line 11 to col.3, line 31).

Response to Arguments

Applicant's arguments filed June 14 ,2004 have been fully considered but they are not persuasive. Applicants argue that Hutchins et al is a different field is not well taken because Hutchins et al discloses a method for recovering metals comprising bioleaching a mineral sulfide with an aqueous solution containing a *Sulfolobus* species thermophile and aeration is achieved by using air or oxygen . Therefore a mixture of

Art Unit: 1742

air and oxygen would have been obvious to one of ordinary skill in the art at the time the invention was made since oxidation of a mineral sulfide is achieved in all cases.

Applicants argue that neither air or oxygen will suffice instead air enriched with pure oxygen is used but the specification on page 7, lines 2 to 9 states that it is known that the implementation of the process necessitates an oxygenation of the culture medium by **“an air injection”** and further states that the injected air might be enriched with pure oxygen consequently the addition of oxygen to air is an option but not critical as argued. Applicants' opinion that the addition of oxygen would have an immediate effect of killing the bacteria is not supported by any evidence. Applicants argue that oxygen content of the air must be raised but not to the level of pure oxygen but the concentration of oxygen in the “air enriched with pure oxygen” is not disclosed.

Applicants' argument that Tunley does not disclose the claimed step “a continuous supply of the ore is effected” is not well taken since it is well within the expected skill of the technician to operate a process continuously. *In re Dilnot* 138 USPQ 248

Applicants' argument that Tunley does not teach mechanical agitation is not well taken since a slurry is formed agitation of the slurry is conventional as evidenced by Hutchins et al (see FIG.4)

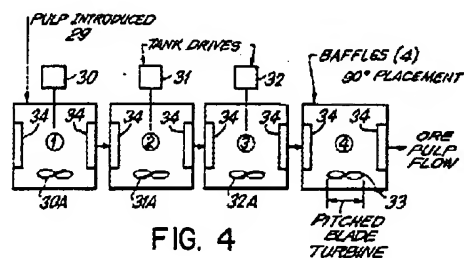


FIG. 4

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvyn J. Andrews whose telephone number is (571)272-1239. The examiner can normally be reached on 8:00A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on (571)272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mja
August 30, 2004


MELVYN ANDREWS
PRIMARY EXAMINER